Radiocommunication Study Groups

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North American Broadcasters Association (NABA)

PRELIMINARY DRAFT NEW RECOMMENDATION ITU-R BT.[PROTECT]

Guidelines for the protection of the terrestrial television broadcasting from interference in the VHF/UHF bands

The North American Broadcasters Association (NABA, *www.nabanet.com*) is an association of broadcasters in Canada, Mexico, and the United States, and the NABA Technical Committee is its standing technical body. NABA is thus in a position to present the technical viewpoints of the most authoritative association of professional North American Broadcasters in television and sound programme production, post-production, and distribution for terrestrial, satellite, and cable broadcasting.

NABA is a Sector Member of ITU-R and a long-time participant in ITU-R Study Groups, Working Parties, Task Groups, Rapporteur groups, etc. NABA numbers among its members Chairmen, Vice-Chairmen and members of the above groups. NABA also participates widely in the ITU work on radio, television and multimedia services and has a strong interest in spectrum management studies including spectrum engineering techniques, spectrum management fundamentals, spectrum monitoring, and inter-service sharing, interference and compatibility.

NABA notes that in Annex 5 of the Chairman's Report (Document 6A/196) for the May 2009 meeting of WP 6A the preliminary draft new Recommendation on "Guidelines for the protection of the terrestrial broadcasting service from interference" was further developed. NABA also notes that the Administration of Japan in Document 6A/172 has made several important observations that need to be incorporated in the PDNR. These observations included:

Quote:

- The terrestrial broadcasting services in VHF/UHF bands are often planned on a noise-limited basis as protected services, especially in the case of television broadcasting.
- The plan of terrestrial television broadcasting network is based on sharing and compatibility criteria between BS and BS including not only analogue but also digital systems as described in the Recommendation ITU-R BT.1368.

- Regarding digital television broadcasting, during discussion under Agenda item 1.11 of WRC-07, for frequency sharing between BS and BSS in 620-790 MHz band, it was agreed as described in Report ITU-R BT.2075 that beyond the protection ratio required for BS-BS intra-service interference, interference contributions arising from inter-service sharing (between BS and interference from other services) need to be 9.1 dB (for ATSC) or 10 dB (for DVB-T and ISDB-T) lower than the noise level to ensure the degradation in the *C*/*N* margin is limited to approximately 0.5 dB of the available margin. It should be noted that 1 dB of degradation of the C/N ratio will cause serious damage to service availability at the edge of the coverage area due to the cliff effect.
- It should be recognized that the global transition from analogue to digital broadcasting in VHF/UHF bands will still continue in many countries after 2011.

Unquote:

NABA also notes that the PDNR addresses the issue of protection to the broadcasting service and not necessarily the sharing of spectrum with a specific radiocommunication service. In light of these concerns, NABA proposes various improvements to the PDNR text as shown in the following Annex.

Annex

[PRELIMINARY] DRAFT NEW RECOMMENDATION ITU-R BT.[PROTECT]

Guidelines for the protection of the terrestrial television broadcastingfrom interference in the VHF/UHF bands

(Question ITU-R 4-1/6)

Summary

This Recommendation provides protection criteria of terrestrial television broadcasting service in the VHF/UHF bands from those services that do have a status in the Radio Regulations.

Scope

This Recommendation provides a guideline for the limit for total aggregate interference to the terrestrial television broadcasting services that may result from the emissions of radiocommunication services.

The ITU Radiocommunication Assembly,

considering

a) that the terrestrial broadcasting service operates in bands assigned by Article 5 of the Radio Regulations (RR) as a primary service;

b) that the terrestrial broadcasting service is often planned on a noise-limited basis;

c) that radiocommunication services may exist with emissions from applications having a corresponding frequency allocation in the RR, that may utilize the frequency bands allocated to the broadcasting services subject to not causing harmful interference that may damage the coverage area of terrestrial television broadcasting in the VHF/UHF bands;

d) that there is an established protection requirement in Recommendation ITU-R BT.1368 for BS-to-BS intra-service interference for both analog and digital television in the VHF/UHF bands;

e) that there is an established protection criteria in Report ITU-R BT.2075 for terrestrial television broadcasting in the 620 to 790 MHz band restricting interference from broadcasting-satellite networks to ensure that the degradation in the C/N margin is limited to approximately 0.5 dB of the available margin;

f) that the planning of broadcasting services has been and is being carried out taking into account decisions of relevant conferences, which did not contemplate emissions of radiocommunication devices not having a status in the RR, nor emission of radiocommunication services that may now be called upon to utilize frequency bands with broadcasting services;

g) that in order to preserve the same broadcasting service quality, the same protection requirements mentioned in *considering* d) and e) should also be applicable to those services that do have a status in the RR and utilize the same frequency bands as the broadcasting service,

recognizing

a) that the global transition from analogue to digital television broadcasting will still continue in many countries in the VHF/UHF bands after 2012,

recommends

1 that beyond the BS-to-BS intra-service protection requirement for television broadcasting in the VHF/UHF bands as mentioned in the Recommendation in *considering* d) above, the total aggregated interference contribution arising from the use of the VHF/UHF spectrum should not increase the minimum usable field strength by more than 0.5 dB*.

* See Informative Appendix.

Informative Appendix

Introduction

Since the frequency spectrum is such a limited resource, the ITU-R has studied protection requirements for inter-service and intra-service interference between broadcasting and other relevant services. These requirements have been submitted to appropriate ITU conferences to help them in making their decisions. The result has been numerous ITU-R Recommendations, Reports, and Agreements which provide for frequency sharing such that interference levels are permitted while maintaining quality by the affected service. This Recommendation draws on the experience of the ITU-R in establishing the protection requirement of 0.5 dB provided in the *recommends*. This Recommendation provides requirements for protection of the broadcasting service from those services that do have a status in the Radio Regulations. This Appendix tabulates some examples of those Agreements, Reports, and Recommendations that utilize 0.5 dB as a protection requirement for both intra-service and inter-service.

Precedent for a 0.5 dB protection requirement

The following ITU-R Agreements, Reports, and Recommendations utilize a 0.5 dB protection requirement:

Geneva 1975 Agreement – Final Acts of the Regional Administrative LF/MF Broadcasting Conference (Regions 1 and 3)

> Article 4 states: "3.2.5 any assignment may be considered affected when its usable field strength is increased by a value equal to or greater than 0.5 dB as a consequence of the proposed modification to the Plan".

Geneva 1984 Agreement – Final Acts of the Regional Administrative Conference for the Planning of VHF Sound Broadcasting (Region 1 and Part of Region 3) – Regional Agreement relating to the Use of the Band 87.5-108 MHz for FM Sound Broadcasting (Region 1 and Part of Region 3)

> Article 4 states: "4.3.7.1 a sound broadcasting station, it should normally accept an increase in the usable field strength at the transmitter site, provided that … the resulting usable field strength … is increased by 0.5 dB or less compared with the usable field strength resulting from the Plan".
>
> Also: "4.3.7.2 a television station, it should normally accept an increase in the usable field strength at the transmitter site, provided that … the resulting usable field strength … is increased by 0.5 dB or less compared with the usable field strength resulting from the Plan".

Report ITU-R BT.2075 – Protection requirements for terrestrial television broadcasting services in the 620-790 MHz band against potential interference from GSO and non-GSO broadcasting-satellite systems and networks

> During discussion under Agenda item 1.11 of WRC-07, there was an agreement in that beyond the protection ratio required for BS-BS intra-service interference, interference contributions arising from inter-service sharing (between BS and interference from other services) need to be 10 dB lower than noise level to ensure that degradation in the *C*/*N* margin is limited to 0.5 dB of the available margin.

Recommendation ITU-R S.671-3 – Necessary protection ratios for narrow-band single channel-per-carrier transmissions interfered with by analogue television carriers

Provides an interference scenario using "an equivalent thermal noise increase of 0.5 dB (referred to as "C/N degradation")".

Recommendation ITU-R F.1706 – Consideration on separation distance to protect P-P FWS from interference caused by NWAS sharing the same frequency band in the 4 to 6 GHz range

Recommends that the protection criteria for P-P FWS sharing the same frequency bands with NWAS should be as follows: – the maximum aggregate interference from the NWAS including base station and terminal stations should be such that the degradation to an FWS receiver threshold does not exceed 0.5 dB under free space propagation conditions.

Conclusion

The use of a protection requirement of 0.5 dB is not without precedent as is shown above. It is, therefore, appropriate to recommend that the total aggregate interference contribution arising from the use of the frequency bands utilized by the broadcasting service should cause an increase in the minimum usable field strength of more than 0.5 dB.